IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of: Box:

Applicant: Eric BENAZZI et al. Group Art Unit: 1755

Serial No.: 09/103,528 Examine: D. Sample

Filed: June 24, 1998

For: EU-1 ZEOLITE CATALYST AND A PROCESS FOR IMPROVING THE POUR POINT FEEDS CONTAINING PARAFFINS

REPLY BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

SIR:

REMARKS

The following remarks are presented to address various comments made in the Examiner's Answer. The Examiner is thanked for pointing out minor errors in the Appendix of the Claims. A substitute Appendix is attached to this Reply Brief.

The Declaration of Record is Relevant to the Remaining Rejections under 35 U.S.C. §103

At page 5 of the Examiner's Answer, it is admitted that the second Declaration of Record successfully overcame the §103 rejection over Casci et al., alone. See the third full paragraph at that page. Casci et al. disclose zeolites of the same type as presently claimed, but produced with a given Si/Al ratio as synthesized, versus the present materials, claimed in product-by-process format, which are produced by dealuminating a zeolite to achieve a higher than starting ratio.

Appellants have explained, in their Brief, how the declaration establishes that a zeolite with a given Si/Al ratio as synthesized is different from a zeolite with the same ratio

achieved by dealumination, as claimed in their application. The Answer accepts this logic as persuasive to eliminate the rejection over Casci, but argues that the similar rejection over Casci taken with the secondary reference Kuehl is not so overcome. It is submitted, however, that the Declaration is persuasive on the combination rejection, for the same or similar reasons, that it overcomes the rejection over the primary reference alone.

The rejection over Casci alone is also an obviousness rejection, being under §102-103 - See page 5 of the Answer. Casci fails to disclose the removal of alumina atoms from the framework, instead disclosing ratios attributable to as-synthesized zeolites. Kuehl discloses that it may be advantageous, for zeolites which differ from those of the primary reference, to increase the ratio of silica to alumina by removing alumina from the framework. The advantage is not attributed to the removal, *per se*, but to the resultant high silica to alumina ratio. Thus, if one of ordinary skill in the art takes these teachings together, it would be obvious, arguably, to produce the zeolites of the primary reference with high silica/alumina ratios - and it should not matter whether these materials are produced by the method of the secondary reference. And yet, the Examiner's Answer admits that such zeolites produced by dealumination have different characteristics and, that they are improved where produced by dealumination.

If, instead, the Examiner's Answer is suggesting that it would be obvious to produce a zeolite in accordance with the primary reference and then to dealuminate it, on the one hand, this logic has never been explicitly stated and, on the other hand, it is submitted that there is simply no motivation to do so for at least two reasons. First, the zeolites of the primary reference have silica/alumina ratios which are acceptable. Thus, one of ordinary skill in the art would not be motivated to undertake additional steps. Kuehl, in fact, not only "does not specifically recite that its method is amenable with EU-1" (see page 3 of the Examiner's Answer) but indicates that sometimes dealumination has bad effects on various zeolites. See column 2, indicating that for zeolite Y, removal of aluminum destroyed the crystalinity of the resultant material. See lines 45-49 of the patent. Second, dealumination treatments of the secondary reference are intended for zeolites which are not produced with high silica/alumina ratios, *see*, for example, the indication at col. 3, lines 31-32, that materials for use in dealumination according to the patent have starting ratios "of at least 12," (equivalent to an atomic Si/Al ratio of 6). Examples 1 to 5 of the patent use starting

materials with the silica/alumina ratio of 40 (a Si/Al ratio of 20). Even where the patent starts with a somewhat higher ratio (e.g., Example 8, an atomic ratio of 35) patentees state that the results after treatment "were not as pronounced" as with the material having an atomic ratio of 20 used in Examples 1-5. In light of this disclosure, it would simply not have been obvious for one of ordinary skill in the art to dealuminate the materials produced in the primary reference, which are, as synthesized, at Si/Al of 22.5 to 60 in Table 4. Thus, it is submitted that motivation to modify the materials of the primary reference by dealuminating them is absent, particularly when it is shown that two equivalent materials, one produced by dealumination, have different properties in which the dealuminated materials is advantageous.

Appellants' Data Is Prohibitive of Non-Obviousness and Does Not "Merely Recognize an Additional Advantage" Flowing Naturally from the Prior Art

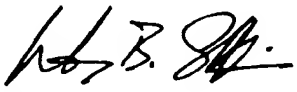
At page 5 of the Examiner's Answer, it is argued that it is merely an additional advantage flowing naturally from the prior art for the dealumination to produce improved characteristics. This is not applicant's argument as discussed above. Instead, the data shows that there would have been no motivation to dealuminate the material of the prior art. One of ordinary skill in the art would expect, in view of the teachings of Kuehl, that, producing a zeolite with a given ratio or dealuminating a zeolite with a lower ratio to produce an equivalent ratio would not produce any unexpected results. Kuehl does not teach that the dealumination produces an improvement, but that higher silica/alumina ratios produce an improvement. It has now been recognized, and forms a basis of the present invention, that achieving those ratios by dealumination for EU zeolite is unexpectedly advantageous. Thus, the unexpected results show that one of ordinary skill would not have been motivated to combine the teachings as argued in the Examiner's Answer.

Appellants Declaration Is Commensurate With the Scope of the Claims

It is again argued, at pages 5 and 6 of the Answer, that since the present claims are broader than just alumina, and do not recite narrow silicon/aluminum ranges, they are broader in scope than the Declaration. Regardless, it is submitted that the Declaration is persuasive of non-obviousness for all of the claims, having disproved the expectation that it is only the ratio which matters. This result would now be expected to be achieved over all ratios produced by dealumination. The Examiner's Answer has not provided a reason to doubt this. Moreover, the art recognizes the various T elements claimed as equivalent to aluminum. Thus, the Declaration is submitted to be commensurate in scope.

It is therefore respectfully submitted that ample basis to overturn the rejections exist, the same is again respectfully requested.

Respectfully submitted,



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Claims on Appeal
Serial No. 09/103,528

1. A modified EU-1 zeolite comprising silicon and an element T which is Al, Fe, Ga, or B, produced by a process in which at least a portion of elements T are removed from a starting zeolite, whereby the modified zeolite has a global atomic ratio Si/T higher than that of the starting zeolite, by at least 10% of the Si/T ratio of the starting zeolite.

2. A zeolite according to claim 1, in which Si/T of the modified zeolite is at least 20.

3. A zeolite according to claim 1, in which Si/T of the modified zeolite is over 60.

4. A zeolite according to claim 1, in which Si/T of the modified zeolite is at most 600.

5. A zeolite according to claim 1, in which Si/T of the modified zeolite is at most 300.

6. A zeolite according to claim 1, in which T is aluminium (Al).

7. A process for preparing a zeolite according to claim 1, by treating a EU-1 zeolite obtained by synthesis using at least one solution of an acid.

8. A process for preparing a zeolite according to claim 1, using at least one heat treatment of a EU-1 zeolite obtained by synthesis followed by at least one treatment with a solution of an acid.

9. A process for preparing a zeolite according to claim 1, in which the EU-1 zeolite obtained by synthesis is dealuminated by at least one heat treatment followed by at

least one treatment using a chemical dealuminating compound which is ammonium hexafluorosilicate, silicon tetrachloride, or ethylenediaminetetra-acetic acid, optionally in its sodium or disodium form.

10. A process for preparing a zeolite according to claim 1, in which the EU-1 zeolite obtained by synthesis is dealuminated by at least one treatment with a chemical dealuminating compound which is ammonium hexafluorosilicate, silicon tetrachloride, or ethylenediaminetetra-acetic acid, optionally in its sodium and disodium form.

11. A catalyst comprising EU-1 zeolite according to claim 1.

12. A catalyst according to claim 11, comprising at least one matrix and 0.5% to 99.5% by weight of EU-1 zeolite with respect to the matrix + zeolite mixture.

13. A catalyst according to claim 11, further comprising at least one hydro-dehydrogenating element.

14. A catalyst according to claim 13, in which the hydro-dehydrogenating element is a noble group VIII element.

15. A catalyst according to claim 13, in which the hydro-dehydrogenating element is a combination of at least one group VI metal or compound and at least one non noble group VIII metal or compound.

16. A catalyst according to claim 15, containing phosphorous.

17. A catalyst according to claim 13, in which the hydro-dehydrogenating element is niobium and/or rhenium.